Work Order ID 91695 October-15-12 2:39:50 PM Item ID: D412-664-209TRN Accept *N900040100* Setup Start **Revision ID:** Crosstube Turning Detail Item Name: Start Date: 15/10/2012 Start Otv: 1.00 **Cust Item ID: Required Date: 29/10/2012** Req'd Qty: 1.00 **Customer:** Reference: Run Approvals: Process Plan: MLJ Date: 12-10-15 Tooling: Date: Date: SPC (Y/N): Date: Sequence ID/ Operation Tool ID Set Up/ Tool # Plan Reject Reject Description Work Center ID **Run Hours** Code Qty **Qty** Number **Draw Nbr Revision Nbr** D412-664-249 Rev B(DEO) 100 0.00 MORI SEIKI CNC LATHE LARGE *100* Mori Seiki 0.00 Memo Mori Seiki CNC Lathe Large 1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA708 2-Turn first side as per Folio FA708 3- File transition lines smooth. FOLIO REV:

mm.6 12/11/02

Stamp

110

QC1- Inspect dimensions to dimension sheet

DWG RĖV:

0.00

Memo

0.00

Quality Control

						,					DQA:	Date	e:	
NCR:	Yes	/ No				WORK ORDER NON-O	COI	NFORI	MANCE / UPD	DATE				
										-	QA Closed:	Date	e:	
Work Ord	er:					DISPOSITION				AGAINST DE	PARTMENT	/PROCESS		
Part NCR	No.					Rework Scrap Use-as-is Work Order Update		Thern	Skid-tube Machining noforming Large Fab	Crosstube Small Fab Finishing Composite	4	Water Jet d. Eng. Coor. re/Packaging Supplier		Engineering Quality Other
Root					Descri	ption of work order update		Initial	Acti	ion	Sign &			
Cause		Date	Step	Qty	(or Non-conformance	Ch	nief Eng	Descri	iption	Date	Verification		QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved						·								
						F/	AUL	T CATE	GORY					
Landi					_	General		1		_	1	-		
	_	Bending			ļ	Bend		Grain			Ovalized	L		ressure/Forced
		Centre No	t Concen	tric to C)/S	BOM/Route	L	Hardwa			Over/Under	⊢	_	emperature/Cure
	-	Cracks				Broken/Damaged	<u> </u>	1	on Incomplete		Part Incorre	<u>-</u>	_	Veld
	-	Crushed/0	Crimped.			Burrs	-	4	ions Incomplete/U	nclear	Part Lost/Mi	ssing	\^	Vrong Stock Pulled
	-	Cuffs				Contamination	L	Mainte			Part Moved			
		Heat Trea	t		<u></u>	Countersink		Mislabe	led		Positioned V	Vrong		
		Inspection	Strip in	Tube		Cut Too Short		Misread			Power Loss/	Surge	0	ther
		Ripples in	Bend			Drill Holes		Offset		_				

Out of Calibration

Out of Sequence

Outside Dimensions

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Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish

QC

Quality Control

Page 2

October-15-12 2:39:50 PM Item ID: D412-664-209TRN Accept *N900040100* Setup Start **Revision ID:** Item Name: Crosstube Turning Detail **Start Date:** 15/10/2012 Start Qty: 1.00 **Cust Item ID: Required Date:** 29/10/2012 Req'd Qty: 1.00 **Customer:** Reference: Run Approvals: **Process Plan:** Date: **Tooling:** Date: Stop QC: Date: SPC (Y/N): Date: Sequence ID/ Operation Tool ID Tool# Set Up/ Plan Accept Reject Reject Insp. **Work Center ID Description** Qty **Run Hours** Code **Qty** Number Stamp 120 0.00 MORI SEIKI CNC LATHE LARGE *120* Mori Seiki 0.00 Memo gnar, L 12/11/05 Mori Seiki CNC Lathe Large 1-Turn second side as per Folio FA708 2- File transition lines smooth. 3- Remove sand and plugs 4-Scribe part # and batch # using vibrating stylus as per Dwg D412-664-Inside of Cuff(Donot engrave on outside of tube) FOLIO REV: DWG REV: 130 QC1- Inspect dimensions to dimension sheet 0.00

0.00

Memo

gran. 6 12/11/05

											DQA:	Date:	
NCR:	Yes	/ No				WORK ORDER NON-	CO	NFOR	MANCE / UPI	DATE			
											QA Closed:	Date:	
Work Ord	ler.					DISPOSITION				AGAINST DI	EPARTMENT	/PROCESS	
WOIR OIC						Rework	٦		Skid-tube	Crosstube	٦	Water Jet	Engineering
Part	No.					Scrap	1		Machining	Small Fab	Pro	d. Eng. Coor.	Quality
						Use-as-is	1	Thern	noforming	Finishing	⊣ ′	re/Packaging	Other
NCR	No.					Work Order Update]		Large Fab	Composite]	Supplier	
Root			1	[Descr	iption of work order update	Т	Initial	Act	tion	Sign &		
Cause		Date	Step	Qty		or Non-conformance		nief Eng		ription	Date	Verification	QC Inspector
Doc/Data	Ī				,		†		· .				
 Equip/Tooling									·			1	
Operator							1						
Material							1						
Setup							1						
Other													
Process										,			
Supplier							İ						
Training													
Unapproved							<u> </u>						
					**************************************		AUL	T CATE	GORY				
Landi		I			_	General- ¬	_	1			7		1
	Щ	Bending			<u> </u>	Bend	L	Grain			Ovalized		Pressure/Forced
		Centre No	ot Concer	ntric to	O/S	BOM/Route	\perp	Hardwa			Over/Under	tolerance	Temperature/Cure
		Cracks				Broken/Damaged		Inspecti	on Incomplete		Part Incorre	ct	Weld
1.		Crushed/	Crimped.		-	Burrs		Instruct	ions Incomplete/U	Jnclear	Part Lost/Mi	issing	Wrong Stock Pulled

Maintenance

Out of Calibration

Out of Sequence

Outside Dimensions

Mislabeled

Misread

Offset

Part Moved

Positioned Wrong

Power Loss/Surge

Other

Contamination

Countersink

Cut Too Short

Drill Holes

Drawing

Finish

Folio

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

Cuffs

Heat Treat

Inspection Strip in Tube

Torque Waves in Extrusion

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October-15-12 2:39:50 PM

Quality Control

D412-664-209TRN Item ID: Accept *N900040100* Setup Start **Revision ID:** Item Name: Crosstube Turning Detail **Start Date:** 15/10/2012 Start Qty: 1.00 **Cust Item ID: Required Date: 29/10/2012** Req'd Qty: 1.00 **Customer:** Reference: Run **Process Plan:** Approvals: Date: Tooling: Date: QC: SPC (Y/N): Date: Date: Sequence ID/ **Operation** Tool ID Set Up/ Tool # Plan Accept Reject Reject Insp. Work Center ID **Description Run Hours** Qty Code Qty Number Stamp 140 QC8- Inspect parts - second check 0.00 *140* 12-11-6 QC 0.00 Memo Quality Control 150 0.00 *150* HandFXtube 0.00 Memo Hand Finishing Crosstubes I- PRESSURE WASH X-TUBE INSIDE AND OUT 2- ACID ETCH X-TUBE INSIDE AND OUT. USE RED SCOTCH BRITE 160 QC5- Inspect part completeness to step on W/O 0.00 OC 0.00 Memo

NCR: Yes / No	WORK ORDER NON-CON	DQA: NFORMANCE / UPDATE QA Closed:
Work Order:	DISPOSITION	AGAINST DEPARTMENT/PR
work order:	Rework	Skid-tube Crosstube
Part No.	Scrap	Machining Small Fab Prod. E

Work Ord	er:				DISPOSITION				AGAIN	IST DE	PARTMENT	/PROCESS	·
Part I	No				Rework Scrap Use-as-is Work Order Update		Thern	Skid-tube Machining noforming Large Fab	Crosstu Small F Finish Compos	ab ing	4	Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other
Root				Descri	ption of work order update		nitial	Ac	tion		Sign &		
Cause	Date	Step	Qty	(or Non-conformance	Ch	ief Eng	Desc	ription		Date	Verification	QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training												,	
Unapproved	L_ L		<u> </u>			<u> </u>	T 64TF	0007					
l and:	ng Gear				General F	AUL	T CATE	GORY					
Lanui	Bending Centre I Cracks Crushed Cuffs Heat Tre Inspection Ripples Torque Turning	/Crimped /Crimped eat on Strip in n Bend Waves in E Sequence	Tube extrusion	7	Bend BOM/Route Broken/Damaged Burrs Contamination Countersink Cut Too Short Drill Holes Drawing Finish		Instruct Mainte Mislabe Misread Offset Out of O	on Incomplete ions Incomplete/ nance led Calibration equence	Unclear		Ovalized Over/Under Part Incorred Part Lost/Mi Part Moved Positioned V Power Loss/S	ct ssing Vrong	Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled Other
	Wave/T	wist in Tub	e	1	Folio		Outside	Dimensions					

Date:

Date:

120

Quality Control

QC

October-15-12 2:39:50 PM Item ID: D412-664-209TRN Accept *N900040100* Setup Start **Revision ID:** Crosstube Turning Detail Item Name: **Start Date:** Start Qty: 1.00 15/10/2012 Cust Item ID: **Required Date: 29/10/2012** Req'd Qty: 1.00 **Customer:** Reference: Run Approvals: Process Plan: Date: Tooling: Date: QC: Date: SPC (Y/N): Date: Sequence ID/ Operation Tool ID Tool # Plan Set Up/ Accept Reject Reject Work Center ID Description **Run Hours** Code Qty Qty Number Stamp 170 0.00 Packaging *170* 12-11-7 Packaging 0.00 Memo Packaging Identify and stock in kanban rack Location: ____ 180 QC21- Final Inspection - Work Order Release 0.00

0.00

Memo

12/11/18 to

Insp.

											DQA:	Date	e:
NCR:	Yes	/ No				WORK ORDER NON-O	CO	NFORI	MANCE / UP	DATE			
ř								 			QA Closed:	Date	<u> </u>
Work Ord	er:					DISPOSITION				AGAINST DE	PARTMENT,	/PROCESS	
Part	No.					Rework Scrap Use-as-is		1	Skid-tube Machining noforming	Crosstube Small Fab Finishing	4	Water Jet d. Eng. Coor. re/Packaging	Engineering Quality Other
NCR	NO.					Work Order Update]		Large Fab	Composite]	Supplier	
Root					Descri	ption of work order update		Initial	Ac	tion	Sign &		
Cause		Date	Step	Qty	(or Non-conformance	Cł	nief Eng	Desc	ription	Date	Verification	QC Inspector
Doc/Data													
Equip/Tooling	Ш												
Operator	Ш												
Material	Ш												
Setup	Ш												
Other													
Process	Ш												
Supplier	Ш												
Training	Ш												
Unapproved							1					·	
							AUI	T CATE	GORY				
Landi		1				General		1		_	1	г	
	\vdash	Bending				Bend	\vdash	Grain			Ovalized	-	Pressure/Forced
	\vdash	Centre No	ot Concer	ntric to	o/s	BOM/Route	_	Hardwa			Over/Under	} −	Temperature/Cure
	\vdash	Cracks			_	Broken/Damaged	<u> </u>	d `	on Incomplete		Part Incorred	⊢	Weld
	-	Crushed/0	Crimped.			Burrs		4	ions Incomplete/	Unclear	Part Lost/Mi	ssing	Wrong Stock Pulled
	Н	Cuffs				Contamination		Mainte			Part Moved		
		Heat Trea				Countersink		Mislabe			Positioned V		_
	-	Inspection	•	Tube		Cut Too Short	$oxed{oxed}$	Misread	†		Power Loss/	Surge	Other
	\dashv	Ripples in				Drill Holes		Offset					
	ΙÍ	Torque W	aves in E	xtrusio	n	Drawing	1	Out of C	Calibration				

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Finish

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Picklist Print

October-15-12 2:39:53 PM

Work Order ID: 91695

D412-664-209TRN

Parent Item Name: Crosstube Turning Detail

91695

D412-664-209TRN

Start Date: 15/10/2012

Required Date: 29/10/2012

Page 1

Start Qty: 1.00

Required Qty: 1.00

Comments:

Parent Item:

IPP Rev:A New Issue 08-03-06 DD verified by:ec

IPP Rev B 08.04.02 Removed polish EC verified by: DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6009-129		Manufactured	No			110	Each	1.0000	1	1			-
D6000 40	·Λ								ale ale	•			

106009-179

Crosstube Material

Location Loc Qty Loc Code LG 69801

75630

1 mon l 12/11/1

											DQA:	Date:	
NCR:	Yes /	No				WORK ORDER NON-C	100	NFOR	MANCE / UPDATE			-	
											QA Closed:	Date:	
Work Ord	or:					DISPOSITION			AG	ÄŤŇST DE	PARTMENT	/PROCESS	
Work Oru	ei. <u>—</u>					Rework	1		Skid-tube Cros	sstube		Water Jet	Engineering
Part I	No.					Scrap	1	1		all Fab	Pro	d. Eng. Coor.	Quality
						Use-as-is]	Thern	noforming Fir	nishing	Rec/Sto	e/Packaging	Other
NCR I	No	····				Work Order Update]		Large Fab Com	posite		Supplier	
Root					Descri	ption of work order update		nitial	Action		Sign &		
Cause		Date	Step	Qty	(or Non-conformance	Ch	ief Eng	Description		Date	Verification	QC Inspector
Doc/Data													
Equip/Tooling										:			
Operator													
Material													
Setup													
Other													
Process													
Supplier													
Training													
Unapproved													
					m 5 e	F/	AUL	T CATE	SORY				
Landi	ng Gea	r				General					-		
	Ве	nding			L_	Bend		Grain			Ovalized		Pressure/Forced
	Ce	ntre No	t Concer	tric to	o/s	BOM/Route		Hardwa	re		Over/Under	tolerance	Temperature/Cure
	Cr	acks				Broken/Damaged		Inspecti	on Incomplete		Part Incorred	ct 🗀	Weld
	Cri	ushed/0	Crimped.			Burrs		Instruct	ions Incomplete/Unclear		Part Lost/Mi	ssing	Wrong Stock Pulled
	Cu	ffs				Contamination		Mainte	nance		Part Moved		-
	He	at Trea	t			Countersink		Mislabe	lėd		Positioned V	/rong	

Misread

Out of Calibration

Out of Sequence

Outside Dimensions

Offset

Power Loss/Surge

Other

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

Inspection Strip in Tube

Torque Waves in Extrusion

Cut Too Short

Drill Holes

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

DART AEROSPACE LTD	Work Order:	91695
Description: Crosstube Assembly (412 Low Aft)	Part Number:	D412-664-249
Inspection Dwg: D412-664-249 Rev: B		Page 1 of 2

FIRST ARTICLE INSPECTION CHECKLIST

	spection Sheet awing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
	0.625	+/-0.010	20035	1		vern	OWL-08
	2.680	+0.005/-0.000	2.683			1	000 - 00
	2.680	+0.005/-0.000	2.684				
	2.687	+0.005/-0.000	2.690				
	2.793	+0.005/-0.000	2.758				
	2.930	+0.005/-0.000	2.934	7			
ΕA	3.067	+0.005/-0.000	3071	V			
SIDE	3.205	+0.005/-0.000	3.206				
	3.358	+0.005/-0.000	3 363	$\overline{}$			
	3.378	+0.005/-0.000	3.382	/		,	
	3.500	+0.005/-0.000	3.500	/		U	
							,
	0.625	+/-0.010	.625			vern	CVC-08
	2.680	+0.005/-0.000	2684				4
	2.680	+0.005/-0.000	2-684				
	2.687	+0.005/-0.000	2.691				
	2.793	+0.005/-0.000	2.798				
	2.930	+0.005/-0.000	2.935				
B	3.067	+0.005/-0.000	3.07[
SIDE	3.205	+0.005/-0.000	3.208				
S	3.358	+0.005/-0.000	3-361				
	3.378	+0.005/-0.000	3.379				
	3.500	+0.005/-0.000	3,500			V	
-					-		
	0.127.82	+/-0.020	127.830			tape	LG-22

NCR:	Yes	/	No

DQA:

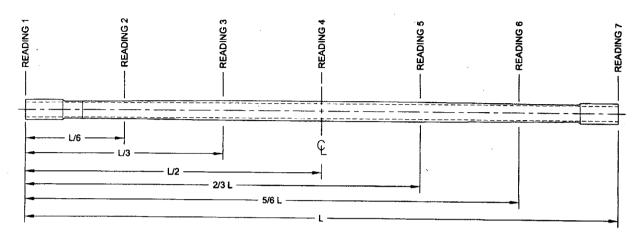
Date:

NCR:	Yes	/ No				WORK ORDER NON-C	OI	NFORI	MANCE / UP	DATE		•	
								-			QA Closed:	Date:	
Nork Ord	ler:					DISPOSITION				AGAINST DE	PARTMENT	PROCESS	
						Rework			Skid-tube	Crosstube]	Water Jet	Engineering
Part	No.					Scrap			Machining	Small Fab	Pro	d. Eng. Coor.	Quality
						Use-as-is		Thern	noforming	Finishing	Rec/Stor	e/Packaging	Other
NCR	No.				· · · · · · · · · · · · · · · · · · ·	Work Order Update			Large Fab	Composite]	Supplier	
Poot		1			Doscri	ption of work order update		Initial	Λ.	tion	Sign &	··	
Root Cause		Date	Step	Qty	i .	or Non-conformance	1	iiiliai iief Eng	•	ription	Date	Verification	QC Inspector
oc/Data	Т	Date	step	Qty		or ivon-comormance	Ci	ner eng	Desc	приоп	Date	vermeation	QC IIISPECTOI
oc/Data quip/Tooling	-												
perator	\vdash	1											N.
laterial	<u> </u>												
etup													
ther	Н	1			-								
rocess	T			,									
upplier	厂												
aining	Г												
napproved													
						F.A	\UL	T CATE	GORY		•		
Land	ng (Gear			·	General					_		
		Bending				Bend		Grain			Ovalized		Pressure/Forced
	L	Centre No	t Concer	tric to	o/s	BOM/Route		Hardwa	re .		Over/Under	tolerance	Temperature/Cure
	L	Cracks				Broken/Damaged		Inspecti	on Incomplete		Part Incorred	:t	Weld
		Crushed/0	Crimped.			Burrs		Instruct	ions Incomplete/	Unclear	Part Lost/Mi	ssing	Wrong Stock Pulled
	L	Cuffs				Contamination		Mainte	nance		Part Moved		
		Heat Trea	t			Countersink		Mislabe	led		Positioned W	/rong	
	L	Inspection	Strip in	Tube		Cut Too Short		Misreac			Power Loss/	Surge	Other
		Ripples in	Bend			Drill Holes		Offset					
		Torque W	aves in E	xtrusio	າ 🔼	Drawing		Out of C	Calibration				
		Turning Se	equence			Finish		Out of S	equence				
		Wave/Twi	ist in Tub	e	1	Folio		Outside	Dimensions				

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DART AEROSPACE LTD	Work Order:	91695
Description: Crosstube Assembly (412 Low Aft)	Part Number:	D412-664-249
Inspection Dwg: D412-664-249 Rev: B		Page 2 of 2

WALL THICKNESS MEASUREMENT



	WALL	THICKNESS	MEASUREMEN	NT (IN)	Deviation	
Location	w1	w2	w3	w4	Δw (max-min)	TOLERANCE
READING 1 L= 0"	,223	-226	-235	.234	10F2	
READING 2 L= 19	, 233	.254	,253	.240	.621	
READING 3	.419	.424	.396	392	.032	
READING 4	.639	·645	-641	,634	-011	0 073"
READING 5	. 384	-414	.472	.469	1048	
READING 6	.210	. 234	-277	263	,067	
READING 7	.228	.237	-233	:224	.013	

Calibration Result

Actual Block Thickness: 400-750

Sitescan 250 Measured Thickness: 100 -750

Measured by: MM Ly	Audited by:	Preliminary Approval:	
Date: 2/11/06	Date: 12-11-6	Date:	
Pay Data Change			

Rev	Date	Change	Revised by	Approved
Α	08.11.07	New Issue (P/O D212-664-209)	KJ/EC	1.66.000
В	10.11.12	Dwg Rev updated	KJ A	17
В	12.06.04	Wall thickness form added	KJ H	M

NCR:	Yes	/ No				WORK ORDER NON-C	CON	NFORI	MANCE / UP	DATE	QA Closed:	Date:	
Work Ord	er.	- 				DISPOSITION				AGAINST DE	PARTMENT	/PROCESS	
Part NCR	- No					Rework Scrap Use-as-is Work Order Update	Scrap Machining Sm Use-as-is Thermoforming Fire			Crosstube Small Fab Finishing Composite	Pro Rec/Sto	Engineering Quality Other	
Root					Descri	ption of work order update	li	nitial	Act	tion	Sign &		
Cause		Date	Step	Qty	(or Non-conformance	Chi	ief Eng	Descr	ription	Date	Verification	QC Inspector
Doc/Data	Ш												
Equip/Tooling	Ш												
Operator	Ц												
Material	Ы												
Setup	Н										:		
Other	Н												
Process	Н												
Supplier Training	Н												
Unapproved	Н	:			ŧ								
опаррточес	<u> </u>		i	.		F	AUL'	T CATE	GORY				
Landi	ng G	ear				General							
		Bending				Bend		Grain			Ovalized		Pressure/Forced
	П	Centre No	t Concer	ntric to	o/s	BOM/Route	П	Hardwa	re		Over/Under	tolerance	Temperature/Cure
		Cracks				Broken/Damaged		Inspecti	on Incomplete		Part Incorred	ct	Weld
		Crushed/0	Crimped,			Burrs		Instruct	ions Incomplete/l	Jnclear	Part Lost/Mi	ssing	Wrong Stock Pulled
		Cuffs				Contamination		Mainte	nance		Part Moved		
	LJ'	Heat Trea	t			Countersink	Ш	Mislabe	led		Positioned V		•
	$\boldsymbol{\vdash}$	nspection		Tube		Cut Too Short	-	Misread	I		Power Loss/	Surge	Other
	\vdash	Ripples in			L	Drill Holes	-	Offset					
	-	Torque W		xtrusion	·	Drawing	-		Calibration				
	1	Turning Se	equence		1	Finish	Ιİ	Out of S	equence				

Outside Dimensions

DQA:

Date:

Wave/Twist in Tube

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Item	Qty -249	Part Number	Description
1	х	D412-664-249	CROSSTUBE ASSEMBLY (412 LOW AFT)
2	1	D6009-129	CROSSTUBE
3	2	D2856-600-1009	ABRASION STRIP
4	1	D2896-1	SUPPORT
5	2	D3189-1	CHAFING SHIELD
6	2	D3595-063-570	RUBBER CUSHION
7	2	D3660-1	CUFF
8	44	CR3212-4-07	RIVET (OR M7885/3-4-07)
9	4	MS21920-28	CLAMP
10	2	MS21920-30	CLAMP (OR MS21920-32)
11	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
12	A/R	SIKAFLEX-241/-291	SEALANT (OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT)

GENERAL NOTES:

D

С

В

1) MATERIAL: MANUFACTURED FROM D6009-129

FINISHED LENGTH = 127.826±0.020 (BEFORE BENDING/TRIMMING)

2) FINISH: CHEMICAL CONVERSION COAT PER DART OSI 005 4.1 PRIME INSIDE AND OUTSIDE PER DART OSI 005 4.2

PAINT OUTSIDE PER DART QSI 005 4.2
TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.

4) UNITS: INCHES UNLESS OTHERWISE NOTED. BREAK SHARP EDGES: 0.005 TO 0.010 MAX.

IDENTIFICATION: SCRIBE DART PART NUMBER "D412-664-249" AND BATCH NUMBER ON INSIDE OF CUFF

- USING VIBRATING STYLUS.
 USING VIBRATING STYLUS.
 WEIGHT: 42.5 bs. (PER IIN-D212-664)
 PART IS SYMMETRIC ABOUT CENTERLINE.
 WHEN MACHINING TAPER, RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALY, TRANSITION SHOULD BE SMOOTH.

- BE SMOOTH.

 1) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D., EXCEPT UP TO 10% IS ALLOWED IN AREA NOTED.

 1) LIQUID PENETRANT INSPECT OUTSIDE SUFFACE OF CROSSTUBE PER QSI 038.

 12) INSTALL D2896-1 SUPPORT USING 0.03* TO 0.06* THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER MASTAL AT VIOLAND BUILD TO THE GRACALIO.
- D2990-1 THAT WILL BE IN CURTACT WITH THE CROSS TOBE, FER COLORS TO SECRET THE D2896-1
 INSTALL MS21920-30 CLAMPS (OR 32) WITH D3595-063-570 RUBBER CUSHIONS TO SECURE THE D2896-1
 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.

 14) INSTALL D2856-600-1009 ABRASION STRIPS WITH A 0.13 REF GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI
- 15) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE
- 16) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS
- NOT BOTTOMED-OUT AFTER TORQUING.

 17) INSTALL D3860-1 CUFF AFTER CHEMICAL CONVERSION COAT BUT BEFORE PAINT, WITH A LAYER OF SIKAFLEX-241-291 ON PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT BETWEEN CUFF AND CROSSTUBE.

 SEAL EDGE OF CUFF TO ENSURE NO GAPS.

18) TOUCH-UP HOLES WITH CHEMICAL CONVERSION COAT.

SHOP COTY RETURN INCHARA SC UNCONTROLLANCE SUBJECT TO ASSESS DROPERS WITHOUT Section 1: WORK OK OK MLJ NO. 91695 12-10-15

DEO ATTACHED

n

В

В	REVIS STANE		OTES; UPDATE TO CURRENT	RF	09.09.30					
Α	NEW IS	SSUE		CP	07.07.07					
REV.	Ĺ		DESCRIPTION	BY	DATE					
DESIGN		97	DART AEROSPACE LTD							
DRAWN		RF	RF HAWKESBURY, ONTARIO, CANADA							
CHECK	ED	q2	DRAWING NO. REV							
MFG. AF	PPR.	77	D412-664-249		SHEET 1 OF 4					
APPRO'	VED	10	TITLE		SCALE					
DE APP	R.		CROSSTUBE (412 LOW AFT)							
DATE	09.0	9.30	COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CORPORATIVE, AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS MOT TO BE USED 400 ANY PURPOSE ON COMPANIANT TO TO ANY OTHER PERSON WITHOUT WHITTETH PERMASSION FROM DART ARROPMENT TO. WHITTETH PERMASSION FROM DART ARROPMENT TO.							

												DQA:	D	ate:	
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							,				QA (Closed:	D	ate:	
Work Ord	or.					DISPOSITION				AGAINST DE	PART	MENT	/PROCESS		,
Work Ora	···					Rework	1		Skid-tube	Crosstube	1		Water Je	,+ [Engineering
Part f	No.					Scrap		i	Machining	Small Fab	1	Pro	d. Eng. Coo		Quality
					·	Use-as-is	1		noforming	Finishing	R		re/Packagin	_	Other
NCR I	No.					Work Order Update			Large Fab	Composite	1		Supplie	-	
								L							
Root						ption of work order update	ı	Initial		tion	Sig	gn &			
Cause		Date	Step	Qty	(or Non-conformance	Ch	ief Eng	Desc	ription	D	ate	Verificati	on	QC Inspector
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Operator															
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	Ве	nding				Bend		Grain		L	Ovali	ized			Pressure/Forced
	Ce	ntre No	t Concer	tric to (o/s	BOM/Route		Hardwa	re		Over	/Under	tolerance		Temperature/Cure
	Cra	icks				Broken/Damaged		Inspecti	on Incomplete		Part	Incorrec	ct		Weld
	Crı	ushed/C	rimped.			Burrs		Instructi	ions Incomplete/l	Jnclear	Part	Lost/Mi	ssing		Wrong Stock Pulled
	Cu	ffs				Contamination		Mainte	nance		Part	Moved			
	He	at Treat	t			Countersink		Mislabel	led		Posit	ioned V	Vrong		
	Ins	pection	Strip in	Tube		Cut Too Short		Misread	1		Powe	er Loss/:	Surge		Other

Offset

Out of Calibration

Outside Dimensions

Out of Sequence

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

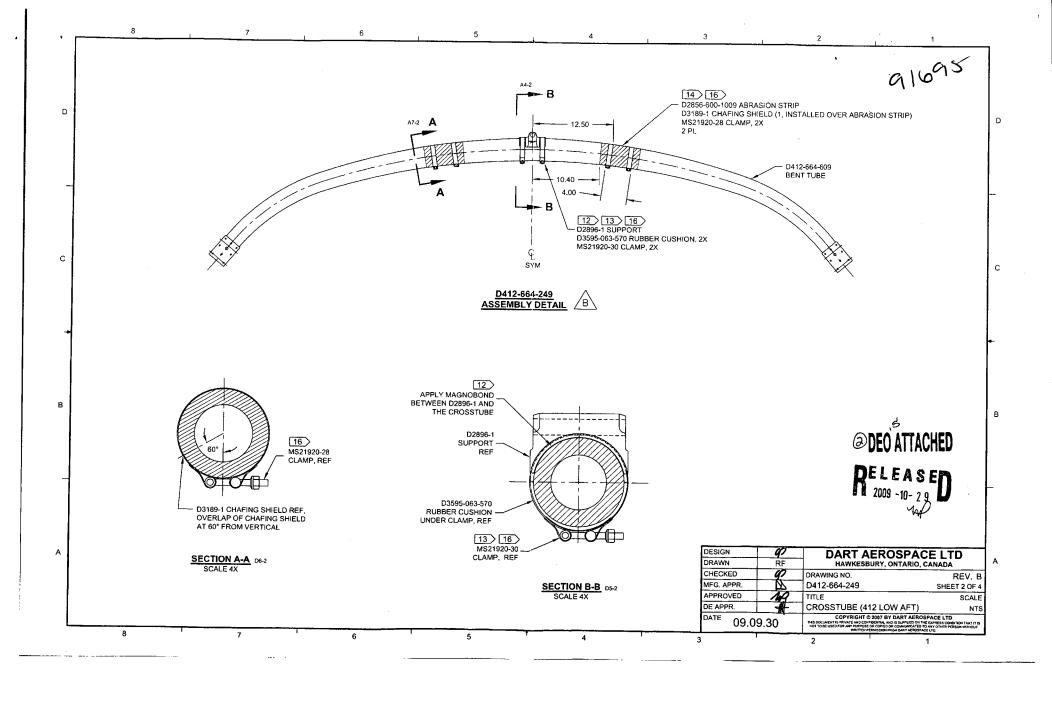
Torque Waves in Extrusion

Drill Holes

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G



											DQA:	Date	
NCR:	Yes	/ No				WORK ORDER NON-	100	NFOR	MANCE / UPDATE				
								y = - 2 sm			QA Closed:	Date	
Work Ord	ler					DISPOSITION			AGA	INST DE	PARTMENT	/PROCESS	
Part No					Rework Skid-tube Machining Use-as-is Thermoforming Large Fab			Machining Small	Fab hing	-1	Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other	
Root					Descri	ption of work order update		Initial	Action		Sign &		
Cause		Date	Step	Qty		or Non-conformance	Ch	nief Eng	Description		Date	Verification	QC Inspector
Doc/Data	Ш												
Equip/Tooling	Ш												
Operator													
Material	Ш												
Setup													
Other	П												
Process	П												
Supplier	П												
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						F	AUL	T CATE	GORY		•		
Landi	ng Ge	ar				General						-	
	В	ending				Bend		Grain			Ovalized		Pressure/Forced
		entre No	t Concer	tric to (o/s	BOM/Route	П	Hardwa	re		Over/Under	tolerance	Temperature/Cure
	\Box c	racks				Broken/Damaged	П	Inspecti	on Incomplete		Part Incorre	ct	Weld
	\Box c	rushed/C	rimped.			Burrs	_	1	ions Incomplete/Unclear		Part Lost/Mi	ssing	Wrong Stock Pulled
	\Box c	uffs				Contamination	-	Mainte	,		Part Moved		-

Mislabeled

Out of Calibration

Out of Sequence

Outside Dimensions

Misread

Offset

Positioned Wrong

Power Loss/Surge

Other

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

Heat Treat

Inspection Strip in Tube

Torque Waves in Extrusion

Countersink

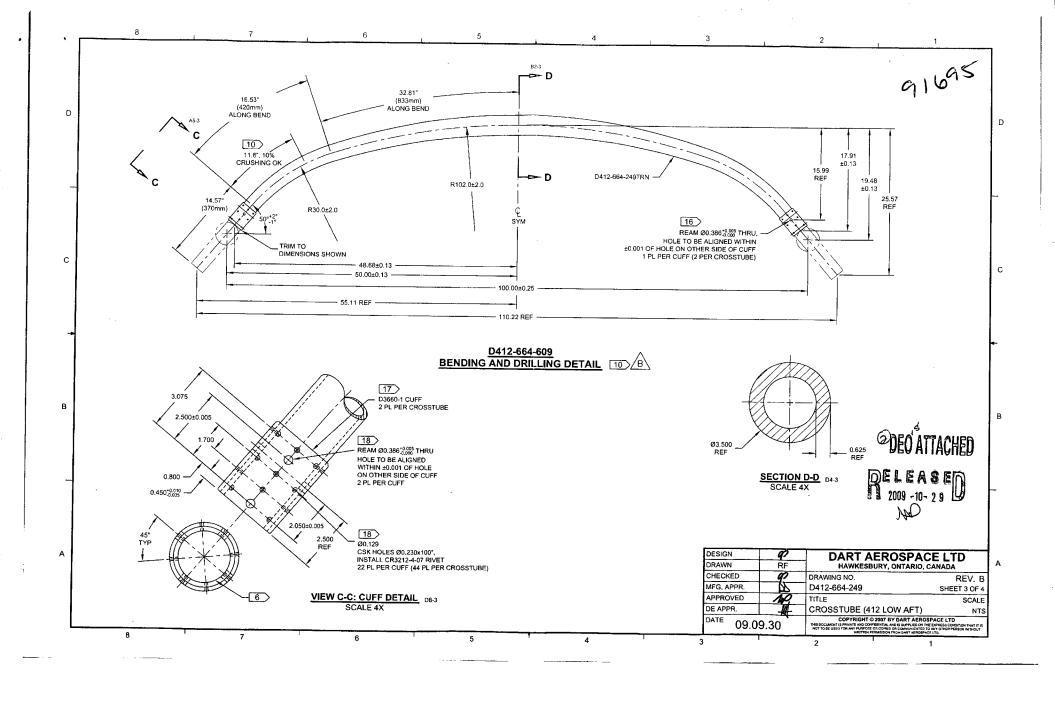
Cut Too Short

Drill Holes

Drawing

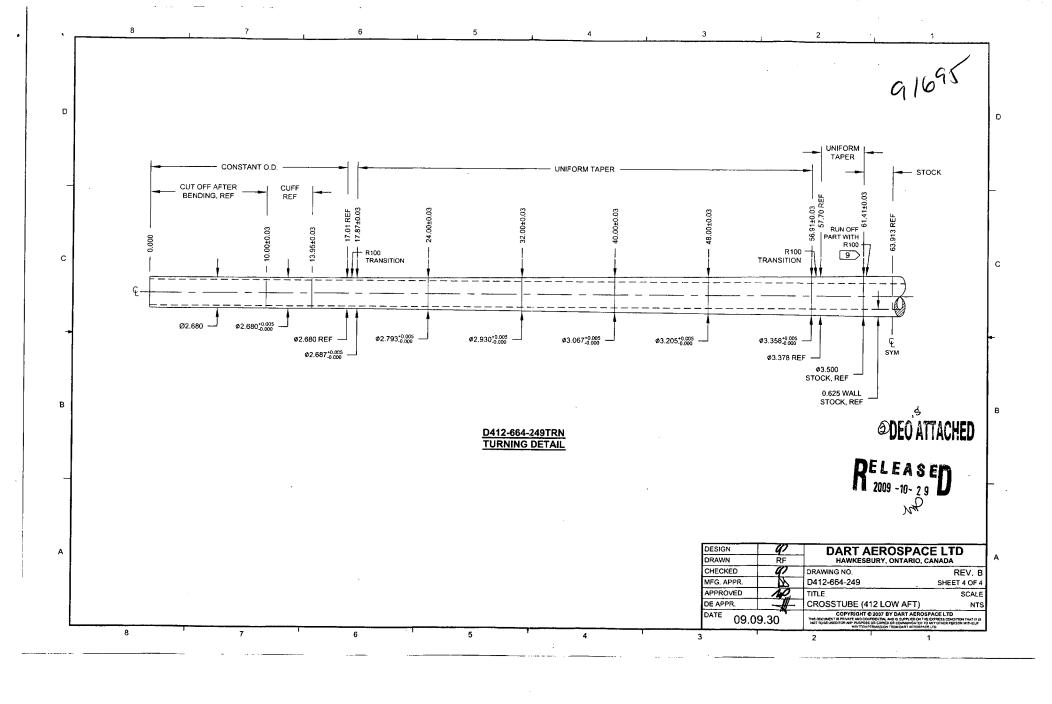
Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G



•		DQA:	Date:	
NCR: Yes / No	WORK ORDER NON-CONFORMANCE / UPDATE			
		OA Clasadi	Date:	

										QA Closed.	Date.	
Work Orde	er:				DISPOSITION			,	AGAINST DE	PARTMENT	/PROCESS	
Part N					Rework Scrap Use-as-is Work Order Update		Skid-tube Crosstube Machining Small Fab Thermoforming Finishing Large Fab Composite			Pro Rec/Sto	Engineering Quality Other	
Root 7				Descri	ption of work order update	l li	nitial	, ,	Action	Sign &		,
Cause	Date	Step	Qty		or Non-conformance	Chi	ief Eng	De	scription	Date	Verification	QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved												
onapproved 1			L			AUL.	T CATE	I GORY		<u> </u>		
Landin					General							
-	Bending Centre Not Concentric to O/S Cracks Crushed/Crimped Cuffs Heat Treat			o/s	Bend BOM/Route Broken/Damaged Burrs Contamination Countersink		Grain Hardware Inspection Incomplete Instructions Incomplete/Unclear Maintenance Mislabeled			Ovalized Pressure/Force Over/Under tolerance Temperature/ Part Incorrect Weld Part Lost/Missing Wrong Stock Force Part Moved Positioned Wrong		
<u> </u>	Inspection		Tube		Cut Too Short		Misreac			Power Loss/		Other
ľ	Ripples in				Drill Holes	ш	Offset		<u> </u>	<u>.</u>	- <u>L</u>	
.	Torque W		xtrusion	,	Drawing	П	Out of C	Calibration				
	Turning Se				Finish		Out of S	equence				
Wave/Twist in Tube			Folio	П	Outside Dimensions							



NCR:	Yes /	No				WORK ORDER NON-	CO	NFORM	AANCE / UPDATE				•	
											QA Closed:	Da	ate:	
Work Ord	er:					DISPOSITION			AG	AINST DE	PARTMENT	/PROCESS		
Part I	 No					Rework Scrap Use-as-is Work Order Update	Scrap Machining Small Fab r-as-is Thermoforming Finishing			all Fab	Water Jet Prod. Eng. Coor. Rec/Store/Packaging Supplier			Engineering Quality Other
Root					Descri	otion of work order update		Initial	Action		Sign &			
Cause		Date	Step	Qty	C	or Non-conformance	Ct	nief Eng	Description		Date	Verification	on	QC Inspector
Doc/Data	Ш													
Equip/Tooling	Ш													
Operator														
Material														
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Other	Ш													
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Landii	ng Geai					General		1			7			
	_	nding			—	Bend	\vdash	Grain		<u> </u>	Ovalized		\vdash	Pressure/Forced
	—		t Concer	ntric to C	-	BOM/Route	<u> </u>	Hardwa		<u> </u>	Over/Under		_	Temperature/Cure
	Cra					Broken/Damaged	\vdash	1	on Incomplete	<u> </u>	Part Incorred		_	Weld
			rimped.		<u> </u>	Burrs	<u> </u>	ł	ons Incomplete/Unclear	<u> </u>	Part Lost/Mi	ssing		Wrong Stock Pulled
	— Cuf				 	Contamination	\vdash	Mainte			Part Moved			
	— 1	it Treat		- '	<u> </u>	Countersink	<u> </u>	Mislabe	ed	<u> </u>	Positioned V	=		
			Strip in	lube		Cut Too Short		Misread			Power Loss/	Surge	Ш	Other
	— 1	ples in				Drill Holes		Offset						
	[Tor	que Wa	aves in E	xtrusion		Drawing	1	Out of C	alibration					

Out of Sequence

Outside Dimensions

DQA:

Date:

Turning Sequence

Wave/Twist in Tube

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

DRAWING NO	. TITLE		DCV D	DART AFRONNA CHAR			
	==		REV. B	DART AEROSPACE LTD	D.E.O. NO.	SHEET NO.	SCALE
D412-664-2	249 CROSSTU	BE ASS'Y (412	2 LOW AFT)	ENGINEERING ORDER	D412-664-249-B-1	SHEET 1 OF 2	NTS
DRAWN	P	CHECKED	Sc	MFG. APPR. R	APPROVED M	DE APPR.	
DATE	11.05.25	DATE	11.05.31	DATE /(.05.3/	DATE 11/05/31	DATE 11.05.31	

PURPOSE:

REMOVED ABRASION STRIP IN FAVOR OF A THIN LAYER OF PROSEAL 890.

91695

CHANGE:

PARTS LIST IS AMENDED AS FOLLOWS:

<u> IS:</u>

item	Qty -249	Part Number	Description
3	0	D2856-600-1009	ABRASION STRIP

WAS:

3	2	D2856-600-1009	ABRASION STRIP
	I		

2013-07-14

NOTE 14, SHEET 1 IS AMENDED AS FOLLOWS:

IS:

14) APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D3189-1 CHAFING SHIELD AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL PROSEALED D3189-1 CHAFING SHIELD ONTO CROSSTUBE BY APPLYING A THIN COAT OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.

WAS:

14) INSTALL D2856-600-1009 ABRASION STRIPS WITH A 0.13 REF GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.

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										DQA:	Date	•	
NCR:	Yes / No				WORK ORDER NON-	co	NFOR	MANCE / UP	DATE				
										QA Closed:	Date	•	
Work Ord	or·				DISPOSITION		AGAINST DEPARTMENT/PROCESS						
Part I	Work Order: Part No. NCR No.				Rework Scrap Use-as-is Work Order Update	Scrap Machinir Use-as-is Thermoformir		Skid-tube Machining noforming Large Fab	Crosstube Small Fab Finishing Composite	b Prod. Eng. Coor. g Rec/Store/Packaging		Engineering Quality Other	
Root				Descri	ption of work order update		Initial	Act	tion	Sign &			
Cause	Date	Step	Qty	C	or Non-conformance	CI	nief Eng	Desc	ription	Date	Verification	QC Inspector	
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved								·					
						AUI	LT CATE	GORY					
Landi		ot Concei 'Crimped.			General Bend BOM/Route Broken/Damaged Burrs		Instructi	on Incomplete ions Incomplete/l	Unclear	Ovalized Over/Under Part Incorred Part Lost/Mi	ct _	Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled	
	Heat Trea	Cuffs Heat Treat Inspection Strip in Tube			Contamination Countersink Cut Too Short		Maintenance Mislabeled Misread			Part Moved Positioned V Power Loss/		Other	
	Ripples in	ı rend			Drill Holes	1	Offset						

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drill Holes

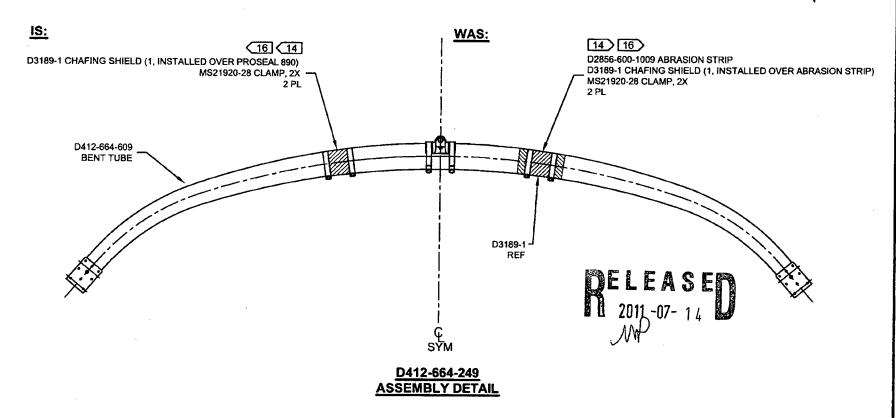
Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

DRAWING NO.	TITLE	REV. B DART AF	ROSPACE LTD D.E.	O. NO. SHEE	T NO. SCALE
D412-664-249	CROSSTUBE ASS'Y (412 LOV			12-664-249-B-1 SHEET	
DRAWN 97	CHECKED S	C MFG. APPR.	& APPROL		#
DATE 11.05	25 DATE 11. o	5.31 DATE 11	1-05.3 (DATE	11/05/3) DATE	11.05,31

91691



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WRITTEN PERMISSION FROM DART AEROSPACE LTD.

NCR:	Yes /	No				WORK ORDER NON-	CO	NFOR	MANCE / UPDATE				
											QA Closed:	Dat	te:
Work Ord	er:					DISPOSITION			AGA	INST D	EPARTMENT	/PROCESS	
	Part No			Rework Scrap Use-as-is Work Order Update Skid-tube Machining Machining Small Fab Thermoforming Finishing Composite			_	Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other				
Root					Descri	ption of work order update		Initial	Action		Sign &		
Cause		Date	Step	Qty	(or Non-conformance	Ct	nief Eng	Description		Date	Verification	n QC Inspector
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Equip/Tooling	Ш												
Operator													
Material													
Setup	Ш												
Other	Ш												
Process	Ш						İ						
Supplier	Ш												
Training	Ш	•											
Unapproved					···-								
							AUL	T CATE	GORY				
Landi	ng Gea				_	General		7		_	- 1	r	
	$oldsymbol{oldsymbol{ o}}$	nding			_	Bend	<u> </u>	Grain		L	Ovalized	Į.	Pressure/Forced
			t Concen	itric to (^{D/S}	BOM/Route	<u></u>	Hardwa		<u> </u>	Over/Under	- t	Temperature/Cure
		icks				Broken/Damaged	\vdash	4	on Incomplete	_	Part Incorre	- F	Weld
	$\boldsymbol{\vdash}$		rimped.			Burrs	<u></u>	4	ons Incomplete/Unclear	<u> </u>	Part Lost/Mi	ssing	Wrong Stock Pulled
	Cuffs Contamination				L	Mainte			Part Moved				
		at Treat			<u> </u>	Countersink	<u></u>	Mislabe		_	Positioned V		
	_		Strip in	Tube	<u> </u>	Cut Too Short	<u></u>	Misread			Power Loss/	Surge [Other
		ples in			<u> </u>	Drill Holes	<u> </u>	Offset					
i	To	Forque Waves in Extrusion Drawing			ı [Drawing	Out of Calibration						

Out of Sequence

Outside Dimensions

DQA:

Date:

Turning Sequence

Wave/Twist in Tube

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

DRAWING NO.	TITLE	REV. B	DART AEROSPACE LTD	D.E.O. NO.	SHEET NO.	SCALE
D412-664-249	CROSSTUBE ASS'Y (412 LOW AFT)	ENGINEERING ORDER	D412-664-249-B-2	SHEET 1 OF 1	NTS
DRAWN q	CHECKED	ASS	MFG. APPR. &	APPROVED A	DE APPR.	
DATE 11.09	0.07DATE	11.09.19	DATE /(.09.19	DATE 11.09.19	DATE 11.09.19	

PURPOSE:

REPLACE MAGNOBOND WITH 3M DP460 SCOTCH-WELD EPOXY ADHESIVE

CHANGE:

IS:

item	Qty -249	Part Number	Description
11	A/R	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD

WAS:

11	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

NOTE 12 & 16, SHEET 1 IS AMENDED AS FOLLOWS:

IS

- 12) INSTALL D2896-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015. LET CURE FOR 24 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 16) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVE HAS CURED FOR 24 HOURS.

WAS:

- 12) INSTALL D2896-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 16) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.



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NCR:	Yes /	No				WORK ORDER NON-	CO	NFORM	MANCE / UP	DATE			
											QA Closed:	Date:	
Work Ord	er.					DISPOSITION				AGAINST DE	PARTMENT	/PROCESS	
Part No			Rework Scrap Use-as-is Work Order Update	Therm	Skid-tube Crosstube Small Fab Thermoforming Finishing Composite			Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other				
Root					Descri	otion of work order update		Initial	Act	ion	Sign &		
Cause	[Date	Step	Qty	C	or Non-conformance	Ct	nief Eng	Descr	iption	Date	Verification	QC Inspector
Doc/Data													
Equip/Tooling													
Operator													
Material	Ш		-										
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Other													
Process	Ш												
Supplier	Ш												
Training	Ш						1						
Unapproved													
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Landi	ng Geai				_	General	_	,			-	·	•
	⊢	nding			<u> </u>	Bend		Grain			Ovalized		Pressure/Forced
	—		t Concer	ntric to ()/S	BOM/Route		Hardwai	re		Over/Under		Temperature/Cure
	Cra					Broken/Damaged	L	4 '	on Incomplete		Part Incorred	ct	Weld
	Crushed/Crimped. Burrs			Burrs	L	Instructi	ons Incomplete/U	Inclear	Part Lost/Mi	ssing	Wrong Stock Pulled		
	Cuf					Contamination		Mainte		<u></u>	Part Moved		
	\blacksquare	at Trea				Countersink		Mislabe	led		Positioned V		1
			Strip in	Tube	<u> </u>	Cut Too Short		Misread			Power Loss/	Surge	Other
		ples in				Drill Holes		Offset					
	Tor	Torque Waves in Extrusion Drawing				Drawing	1	Out of C	alibration				

Out of Sequence

Outside Dimensions

DQA:

Date:

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Turning Sequence

Wave/Twist in Tube

Finish

DRAWING	NO	TITLE		DEV	DAE	TAFO	000405						<u>, , , , , , , , , , , , , , , , , , , </u>
				REV	B DAK	I AER	OSPACE L	שו	D.E.O. NO).	SHI	EET NO.	SCALE
D412-66	4-249	CROSS	STUBE (412 LC	OW AFT)	ENG	SINEER	RING ORDI	ER	D412-66	64-249-B-3	SHE	ET 1 OF 3	NTS
DRAWN	47	· 	CHECKED	4	MFG.	APPR.	\mathcal{P}	Al	PROVED	140	DE APPE	-#	
DATE	12.08.	21	DATE	12.08.30	DATE		12.08.30	DA	ATE	12.08.30	DATE	12.08.30	

PURPOSE:

REMOVED ABRASION STRIP IN FAVOR OF A THIN LAYER OF PROSEAL 890. UPDATE INSTALLATION OF CHAFING SHIELDS AND REDUCE TORQUE TO 40-50 IN-LBS. THIS ENGINEERING ORDER SUPERCEDES DEO D412-664-249-B-1

CHANGE:

PARTS LIST IS AMENDED AS FOLLOWS:

IS:

1 1 1

Item	Qty -249	Part Number	Description
-3	0	D2856-600-1009	ABRASION STRIP



WAS:

. 3	2	D2856-600-1009	ABRASION STRIP

NOTE 14 AND 16 ON SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 14) APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D3189-1 CHAFING SHIELD AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL PROSEALED D3189-1 CHAFING SHIELD ONTO CROSSTUBE BY APPLYING A THIN COAT OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.
- 16) TORQUE CLAMPS ON D2896-1 SUPPORT 80 TO 100 IN-LB. TORQUE CLAMPS ON D3189-1 CHAFING SHIELD 40 TO 50 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

WAS:

- 14) INSTALL D2856-600-1009 ABRASION STRIPS WITH A 0.13 REF GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.
- 16) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

											DQA:	Date	.:		
NCR:	Yes	/ No				WORK ORDER NON-	COI	NFOR	MANCE / UP	DATE		·			
											QA Closed:	Date):		
Work Order:						DISPOSITION		AGAINST DEPARTMENT/PROCESS							
WORK OIG	C1		******			Rework	7	Skid-tube Crosstube			l	Water Jet	Engineering		
Part No.									Small Fab	Prod. Eng. Coor. Qualit					
i aiti	· · · ·			 		▮			Finishing	Rec/Stor	Other				
NCR I	No.					Work Order Update	1	1710111	Large Fab	Composite	nec, sto.	Supplier			
							_			' '	ı				
Root					Descri	iption of work order update		nitial	Act	tion	Sign &				
Cause		Date	Step	Qty		or Non-conformance	Ch	ief Eng	Desci	ription	Date	Verification	QC Inspector		
Doc/Data											"				
Equip/Tooling															
Operator	Ш														
Material															
Setup															
Other															
Process															
Supplier															
Training															
Unapproved															
	FAULT CATEGORY														
Landi	ng Ge	ar				General		•			•	_	_		
	B	ending				Bend		Grain			Ovalized		Pressure/Forced		
		entre No	t Concen	tric to	o/s	BOM/Route		Hardware			Over/Under	tolerance	Temperature/Cure		
	Cı	racks				Broken/Damaged		Inspecti	on Incomplete		Part Incorrect		Weld		
i	Crushed/Crimped.					Burrs		Instruct	ons incomplete/l	Jnclear	Part Lost/Mi	ssing	Wrong Stock Pulled		

Maintenance

Out of Calibration

Out of Sequence

Outside Dimensions

Mislabeled

Misread

Offset

Part Moved

Positioned Wrong

Power Loss/Surge

Other

Contamination

Countersink

Cut Too Short

Drill Holes

Drawing

Finish

Folio

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Ripples in Bend

Turning Sequence

Wave/Twist in Tube

Cuffs

Heat Treat

Inspection Strip in Tube

Torque Waves in Extrusion

DRAWING NO. TITLE DART AEROSPACE LTD REV. B D.E.O. NO. SCALE SHEET NO. D412-664-249 CROSSTUBE (412 LOW AFT) **ENGINEERING ORDER** D412-664-249-B-3 SHEET 2 OF 3 NTS DRAWN CHECKED MFG. APPR. DE APPR. APPROVED 12.08.21 DATE DATE 12.08.22 DATE 12.08.29 12.08.29 DATE 12.18.29 DATE IS: WAS: 14 16 (16)(14) 11.83 D2856-600-1009 ABRASION STRIP D3189-1 CHAFING SHIELD (1, INSTALLED OVER PROSEAL 890) TO CLAMP MS21920-28 CLAMP, 2X D3189-1 CHAFING SHIELD (1, INSTALLED OVER ABRASION STRIP) MS21920-28 CLAMP, 2X 11.60 2 PL TO CHAFING SHIELD Α D412-664-609 BENT TUBE 4.00 D3189-1 **CLAMP SPACING** REF 4.38 CHAFING SHIELD, REF Ç SYM D412-664-249 ASSEMBLY DETAIL

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WRITTEN PERMISSION FROM DART REPOSPACELTD.

											DQA:	Date	e: _	
NCR:	Yes	/ No				WORK ORDER NON-C	COI	NFORM	MANCE / UP	DATE			_	
											QA Closed:	Date	e:	
Work Order:						DISPOSITION	AGAINST DEPARTMENT/PROCESS							
Part No						Rework Scrap Use-as-is Work Order Update		Therm	Skid-tube Crosstube Small Fab Thermoforming Finishing Composite		Water Jet Prod. Eng. Coor. Rec/Store/Packaging Supplier			Engineering Quality Other
	•					·								
Root					Descri	otion of work order update		Initial	Ac	tion	Sign &			
Cause		Date	Step	Qty	c	or Non-conformance	Cr	nief Eng	Desc	ription	Date	Verification		QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved														
						F.A.	AUL	T CATE	GORY					
Landi						General		1			1	Г	7	- 1-
	Bending Centre Not Concentric to O/S Cracks					Bend BOM/Route Broken/Damaged	Grain Hardwa		1		Ovalized Over/Under tolerance]	Pressure/Forced Temperature/Cure Weld
	$\boldsymbol{\vdash}$	Crushed/C	rimned			Broken/Damaged Burrs		Inspection Incomplete						Wrong Stock Pulled
	-	Cuffs	mipeu.		H	Contamination	-	4	Instructions Incomplete/Unclear Maintenance			231116		verong stock rulled
	\vdash	Heat Treat	t			Countersink	-	Mislabeled			Part Moved Positioned V	/rong		
		nspection		Tube		Cut Too Short		Misread			Power Loss/Surge		\neg	Other
	Ripples in Bend					Drill Holes	-	Offset		<u> </u>]		1	<u> </u>

Out of Calibration

Out of Sequence

Outside Dimensions

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Turning Sequence

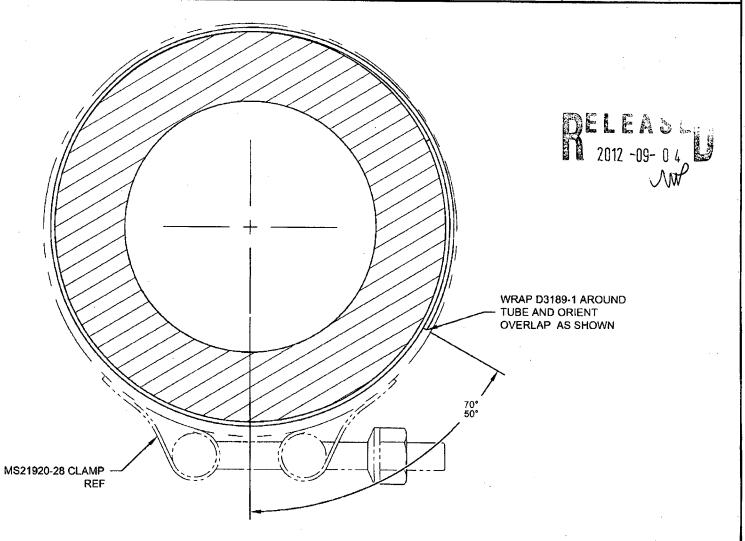
Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish

DRAWING I			REV. B	DART AEROSPACE LTD	D.E.O. NO.	SHEET NO.	SCALE
D412-664	4-249 CR	OSSTUBE (412 LOW	AFT)	ENGINEERING ORDER	D412-664-249-B-3	SHEET 3 OF 3	NTS
DRAWN	q)	CHECKED	<u>4</u> ے	MFG. APPR.	APPROVED MA	DE APPR.	
DATE	12.08.21	DATE	12.08.22	DATE 12.08.29	DATE 12.08.29	DATE 12.08.29	



SECTION A-A CHAFING SHIELD DETAIL VIEW ROTATED, NOT TO SCALE

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	,				MODIC ODDED MONIC	-01	IFODRARRICE / III	DDATE	20,				
NCR: Ye	es / No				WORK ORDER NON-C	JON	IFORIVIANCE / UI		QA Closed:	Date:			
Work Order			,		DISPOSITION		AGAINST DEPARTMENT/PROCESS						
Work Order: Part No. NCR No.					Rework Scrap Use-as-is Work Order Update		Skid-tube Crosstube Machining Small Fab Thermoforming Finishing Large Fab Composite		Water Jet Prod. Eng. Coor. Rec/Store/Packaging Supplier		Engineering Quality Other		
	T	1 .			y and the second				c: 0	note that the second			
Root Cause	Date	Step	Qty		ption of work order update or Non-conformance			ction cription	Sign & Date	Verification	QC Inspector		
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved													
		,			Ę. F.	AUL	CATEGORY						
Landing	Gear Bending				General Bend	П	Grain		Ovalized	13	Pressure/Forced		

Hardware

Maintenance

Out of Calibration

Out of Sequence

Outside Dimensions

Mislabeled

Misread

Offset

Inspection Incomplete

Instructions Incomplete/Unclear

DOA:

Over/Under tolerance

Part Incorrect

Part Moved

Part Lost/Missing

Positioned Wrong

Power Loss/Surge

Temperature/Cure

Wrong Stock Pulled

Weld

Other

Date:

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Ripples in Bend

Turning Sequence

Wave/Twist in Tube

Cracks

Cuffs

Heat Treat

Crushed/Crimped

Inspection Strip in Tube

Torque Waves in Extrusion

Centre Not Concentric to O/S

BOM/Route

Contamination

Countersink

Cut Too Short

Drill Holes

Drawing

Finish Folio

Burrs

Broken/Damaged